Tracing the Structure of Protoplanetary Disks With Optical Forbidden Emission Lines

Mario van den Ancker[1], Bram Acke[2], Rens Waters[3], and Cees Dullemond[4]
(Email: mvandena@eso.org)

[1]European Southern Observatory, Garching, Germany
[2]Instituut voor Sterrenkunde, Katholieke Universiteit Leuven, Leuven, Belgium
[3]Astronomical Institute, University of Amsterdam, Amsterdam, The Netherlands
[4]Max-Planck-Institut für Astrophysik, Garching, Germany

High-spectral resolution ($R > 100,000$) optical spectroscopy of disks surrounding Herbig Ae/Be stars show that narrow (FWHM < 40 km/s) optical forbidden emission lines originate in the surface layers of flared disks. We introduce a spectral deconvolution technique to reconstruct the [O I] 6300.2 Å surface density distribution in the disks, at scales that are complementary to those achieved by interferometry and traditional imaging. Anomalies in several systems are pointed out, which could hint at the existence of gaps in the surface density distribution.